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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/509,779 | 09/29/2004 | Hansjorg Grutzmacher | CO/2-22651/A/PCT | 7683 |

324 7590 11/20/2006

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| EXAMINER |
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CHO, JENNIFER Y

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| ART UNIT | PAPER NUMBER |
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1621

DATE MAILED: 11/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/509,779 | GRUTZMACHER ET AL. | |
| | Examiner | Art Unit | |
| | Jennifer Y. Cho | 1621 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>12/22/2004, 2/27/2006</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Receipt is acknowledged of the Information Disclosure Statements filed 12/22/2004 and 2/27/2006, and the Non-Patent Literature Documents filed 2/27/2006.

Claim Rejections – 35 USC 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 appears to require all the options of the oxidation of an alcohol from claim 1, which include a copper salt, a ligand, a copper complex salt and a base. However, claim 1 indicates the option of having a copper salt with a heterocyclic ligand or a copper complex salt, rather than the requirement of having both. Clarification is requested.

Claim Rejections – 35 USC 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Urch et al. (US Patent 5,912,388), in view of Krohn et al. (J. Org. Chem., 1996, 61, 1467-1472).

Urch teaches a process for catalytically oxidizing alcohols into carbonyls (aldehydes and ketones) (see column 1, lines 18-22), with oxygen in the presence of a base, such as sodium carbonate (Na_2CO_3) (see column 1, lines 57-63), a catalytic amount of copper salt, such as copper chloride (CuCl) (see column 2, lines 5-7), and a ligand, such as 1,10 phenanthroline (see column 1, lines 46-48), with a temperature range for the process between 30-140°C (see column 2, lines 40-43).

Urch is deficient in the sense that it does not teach the oxidation of dihydroxy or polyhydroxy alcohols (polyols) to carbonyls, in comparison to other alcohols.

Krohn teaches the similar reactivity of polyol oxidation, in comparison to other alcohols, including primary, secondary, benzylic and allylic alcohols (see page 1469, 1st column, 3rd paragraph; Table 1, 2 and 3).

Therefore, it would be prima facie obvious to one of ordinary skill in the art at the time of the invention, to use any alcohol of Krohn, in the oxidation of Urch, since the alcohols are recognized as having similar reactivities. The expected result would be the catalytic oxidation of primary and secondary alcohols, including dihydroxy or polyhydroxy alcohols, to the corresponding aldehyde and ketone.

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Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Urch et al. (US Patent 5,912,388), in view of Krohn et al. (J. Org. Chem., 1996, 61, 1467-1472), further in view of Eastlick (US Patent 4,092,306).

The teaching of Urch in view of Krohn has been discussed previously.

Urch is deficient in the sense that it does not teach the oxidation reaction using a quaternary ammonium salt as the base, though it does teach the use of other bases, which include potassium carbonate, sodium carbonate, etc. (see column 1, lines 57-63).

Eastlick teaches the equivalency of bases used in an oxidation reaction, which include quaternary ammonium salts, sodium carbonate, potassium carbonate etc. (see column 3, lines 31-46; column 7, lines 31-34). Additionally, Eastlick teaches that organic bases, such as quaternary ammonium salts are preferable over inorganic bases, such as sodium carbonate, because they will not react to give further oxidizing species (see column 3, lines 31-46) and because the use of quaternary ammonium salts give good yields (see column 6, lines 3-8).

In regards to the limitation of the copper complex, though Urch does not specifically point out the specific copper complex salt of the applicant, the reference does point to copper salts in general and the ability of the copper salt and ligand to form a complex (see column 2, lines 5-14). There is no showing of unusual and/or unexpected results for the applicant's selection of a particular copper complex salt species. The art obtains the same effect for the oxidation of the alcohols.

Therefore, it would be prima facie obvious to one of ordinary skill in the art at the time of the invention, to use any base of Eastlick, in the oxidation of Urch and Krohn,

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since the bases are recognized as being equivalent in the chemical industry. The expected result would be the selective and catalytic oxidation of primary and secondary alcohols, including dihydroxy or polyhydroxy alcohols, to the corresponding aldehyde and ketone, in good yields.

Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Y. Cho whose telephone number is (571) 272 6246. The examiner can normally be reached on 8 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman Page can be reached on (571) 272 0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JC JC

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